

REMARKS/ARGUMENTS

Favorable reconsideration of the present application is respectfully requested.

Applicants note the Information Disclosure Statement filed on August 30, 2005, and request an indication of consideration of the prior art cited therein in the next Office Action.

Claims 1-5 have been amended to recite that the heat exchange system is in a kneading or extruding rotor. Basis for this is evident from the specification and is also found in Claim 6.

Applicants wish to thank Examiner Soohoo for the courtesy of an interview on September 21, 2005, at which time the outstanding rejection was discussed, as were claim amendments according to the present response. No agreement was reached at that time, pending the Examiner's further review of the amended claims and the applied art, after the filing of a written response.

As was discussed during the specification, the presently claimed invention is directed to a kneading or extruding rotor having a heat exchange system which includes a heat exchange chamber in the body of the rotor, wherein a heat transfer medium flows in the heat exchange chamber. An example of a conventional heat exchange system of this type is shown in U.S. Patent 1,881,994 (Banbury), of record, in which spray pipes L are provided within the hollow interiors of the rotors C to spray a heat exchange liquid against the inner surfaces of the rotors. However, generating high uniform heat exchange capability requires that heat transfer medium with a predetermined temperature must flow rapidly and turbulently near the interior wall of the heat exchange chamber. This cannot readily be accomplished in a system such as that of Banbury because the heat transfer medium sprayed from the pipes L will tend to mix with the hot medium already present within the rotor chamber before reaching the interior wall of the heat exchange chamber.

According to a feature of the invention, on the other hand, a heat exchange system in a kneading or extruding rotor includes not only a main tube for the flow of the heat transfer medium, but also branch tubes mounted to the main tube. The heat transfer medium can thus be more precisely delivered to the interior walls of the heat exchange chamber via the branch tubes.

Additionally, the inlet of a rotor body has a diameter less than that of the heat exchange chamber, which makes the introduction of the branch tubes into the heat exchange chamber difficult. Therefore, according to a further feature of the invention set forth in the claims, the branch tubes are flexible, as a result of which they can flex to pass through the inlet when the main tube is inserted or removed, and can then assume a normal position within the heat exchange chamber.

Claim 6 was rejected under 35 U.S.C. §103 as being obvious over U.S. patent 5,791,370 (Harland) in view of Banbury, discussed above. However, as discussed during the interview, the claims define over any combination of the above references.

As already mentioned, Banbury discloses a rubber working machine having rotors C including internal heat exchange chambers which are cooled by a heat transfer medium sprayed through pipes L. However, there is no disclosure in Banbury of branch tubes or of a space provided between the inlet of the body and the pipes L (“said main tube...having a predetermined diameter so that a given space is ensured between said inlet and said main tube”).

Harland discloses a system for ensuring a more rapid supply of hot water following the opening of a hot water valve for a sink or shower (column 1, lines 5-35). According to Harland, an inside tube 10 is provided, through which the hot water flows toward the valve by convection (column 3, lines 52-58). Since the inside tube may be retrofitted to an existing system, it is preferably formed of a flexible material (column 3, lines 27-30). However,

Harland is not directed to a kneading or extruding rotor, nor does it disclose a system wherein an inlet of a heat exchange chamber has a diameter less than that of the heat exchange chamber. The claims therefore clearly define over Harland as well.

Concerning any combination of Harland and Banbury that would have been obvious to those skilled in the art at the time of the invention (paragraph 6 of the Office Action), Harland may teach the desirability of flexibility in piping which must be retrofitted in an existing chamber. However, Harland would not suggest retrofitting in Banbury, suggest the provision of a small diameter inlet in Banbury, suggest the provision of a space between the inlet and main tube in Banbury or suggest the provision of branch tubes in Banbury, since none of these provisions are present in Harland. Conversely, Banbury would not suggest the provision of a space between the inlet and main tube in Harland. Thus the amended claims define over any combination of the above references.

Concerning paragraph 5 of the Office Action, it is noted that U.S. patent 4,697,501 (Hupf) was cited to teach the specific features of the dependent Claims 4 and 5, and provides no teaching for overcoming the shortcomings of Harland, or Harland in view of Banbury, with respect to the amended claims.

Applicants therefore believe that the present application is in condition for allowance and respectfully solicit an early notice of allowability.

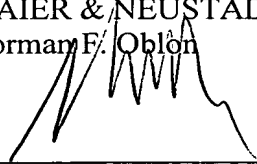
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